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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/855,652	05/16/2001	Keisuke Hatano	Q64500	1374

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SUGHRUE, MION, ZINN, MACPEAK & SEAS
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Washington, DC 20037

EXAMINER

LUU, THANH X

ART UNIT PAPER NUMBER

2878

DATE MAILED: 01/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/855,652	Applicant(s) HATANO ET AL.	
	Examiner Thanh X Luu	Art Unit 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5,6 and 9-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,2,5,6 and 9-28 is/are allowed.
- 6) ☒ Claim(s) 29-40 and 46 is/are rejected.
- 7) ☒ Claim(s) 41-45 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is in response to amendments and remarks filed November 18, 2003. Claims 1, 2, 5, 6 and 9-46 are currently pending.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 29, 31, 33-40 and 46 are rejected under 35 U.S.C. 102(a) as being anticipated by Applicant's Admitted Prior Art (see Figures 1 and 2A-2H), hereinafter, AAPA.

Regarding claims 29, 31 and 33-40, AAPA discloses (see Figures 1 and 2A-2H) a solid-state image pickup method, comprising: first and second insulating films (portions of 606 or portions of 614 or selected combined portions of 606 and 614) formed on a surface of a semiconductor substrate (601), a solid-state image pickup region (to the left) having, as a charge transfer electrode, an electrically conductive material film (627) or conductive electrode material film formed on the first insulating film, and a peripheral circuit region (to the middle and right) formed on the semiconductor electrode other than in the solid-state image pickup region, a device in the peripheral circuit region being isolated from another device by means of an isolating electrode (either instance of 637) on the second insulating film, the isolating electrode being formed of the conductive material film. AAPA also discloses (see Figure 1) a gate

electrode (middle instance of 637) constituting a transistor in the peripheral circuit region is formed on the first insulating film (left instance of 606 and 614) in the peripheral region, and the gate electrode is formed in the same step as that of the isolating electrode (right instance of 637; see also Figure 2E). AAPA also discloses (see Figure 1) the insulating films (thin parts of 606) have the same thickness or the second insulating film (portion of 614) is thicker than the first insulating film (portion of 606). In addition, AAPA discloses (see Figure 1) a third insulating film (third portion of 606) and a gate electrode (one instance of 637) formed on the third insulating layer, the gate electrode is formed in the same step as that of the isolating electrode and of the same material film (see Figure 2E). AAPA also discloses (see Figures 1, 2B and 2C) a first diffusion layer (603) for isolating a device from another is formed on the semiconductor substrate in the solid-state image pickup region; a second diffusion layer (602) for isolating a device from another is formed on the semiconductor substrate below the isolating electrode (637) in the peripheral circuit region, the first and second diffusion layers formed in different steps. AAPA further discloses (see Figure 1) the second diffusion layer (602) is formed to be separated into at least two regions (the instances of 602) on the semiconductor substrate below the isolating electrode (637), and at least one of the regions of the second diffusion layer is connected to the isolating electrode. AAPA also disclose (see page 4, line 4 of the specification) the electrically conductive material film is formed of a polysilicon film. AAPA further discloses (see Figure 1) a fourth insulating film (610) is buried between electrodes formed of the electrically conductive material film, and a surface of the semiconductor substrate

comprising the electrodes and the fourth insulating film is made generally flat. AAPA further discloses (see Figure 2A) forming the first and second insulating films (instances of 606) at the same time. AAPA also discloses forming the first insulating film (606) in the solid-state image pickup region and second and third insulating films (other instances of 606) in the peripheral circuit region, wherein the electrodes are formed at the same time as claimed.

Regarding claim 46, AAPA discloses (see Figure 1) a solid-state image pickup device, comprising: a gate insulting film (606) formed over a surface of a semiconductor substrate; a solid-state image pickup region having, as a charge transfer electrode, an electrically conductive material film (627) formed on the gate insulating film; and a peripheral circuit region formed on the semiconductor substrate other than in the solid-state image pickup region and having an isolating electrode (637) formed of the conductive material film and formed on the gate insulating film.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 30 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA.

Regarding claim 30, AAPA discloses (see Figures 2B-2C) forming the diffusion layers in different steps. However, it is well known in the art to combine steps in order

to speed up fabrication. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to form the diffusion layers in the same step in the apparatus of AAPA to improve throughput in the fabrication process.

Regarding claim 32, AAPA discloses (see Figure 1) the second diffusion layer (602) is formed to be separated into at least two regions (the instances of 602) on the semiconductor substrate below the isolating electrode (637), and at least one of the regions of the second diffusion layer is connected to the isolating electrode. AAPA does not specifically disclose the specific impurity levels of the diffusion layers. However, it is notoriously well known to dope diffusion layers with different levels of impurities to obtain a desired result. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide the second diffusion layer with a higher impurity concentration as claimed in the apparatus of AAPA to obtain a desired response from the device.

Allowable Subject Matter

5. Claims 1, 2, 5, 6 and 9-28 are allowed over the prior art of record.
6. Claims 41-45 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

7. Applicant's arguments filed November 11, 2003 with regards to the claims have been fully considered but they are not persuasive.

Regarding claims 29-40, Applicant further asserts that AAPA does not disclose the isolating electrode on a second insulating film. Examiner disagrees. As understood, Figure 3 of Applicant's invention shows the isolating electrode (117) on a second insulating film (thicker portion of 106). Similarly, AAPA discloses an isolating electrode (167) on a second insulating film (a thick and thin portion of 606). That is, as understood, the differing thicknesses distinguish insulating films from another. If in fact, the AAPA is interpreted as showing only one insulating film, a similar interpretation of Applicant's invention would also show only one insulating film (106) of Figure 3.

Thus, as set forth above, this rejection is proper.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh X. Luu whose telephone number is (571) 272-


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2441. The examiner can normally be reached on Monday-Friday from 6:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta, can be reached on (571) 272-2444. The fax phone number for the organization where the application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

txl
January 13, 2004



Thanh X. Luu
Primary Examiner